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(54) **LED LAMP**

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F21V 15/015	(2006.01)
F21V 17/02	(2006.01)
F21V 29/507	(2015.01)

(52) **U.S. Cl.**

CPC ***F21K 9/30*** (2013.01); ***F21V 15/013*** (2013.01); ***F21V 15/015*** (2013.01); ***F21V 17/02*** (2013.01); ***F21V 29/507*** (2015.01)

(58) **Field of Classification Search**

CPC F21V 15/015; F21V 17/002

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,176,441	A *	1/1993	Horvath dr.nee Vegh	H01K 1/34 362/267
6,425,681	B1 *	7/2002	Agabekov	F21V 3/00 362/223
7,766,510	B2 *	8/2010	Lee	F21S 48/328 362/249.02
7,950,821	B1 *	5/2011	Georgitsis et al.	362/217.12
8,025,422	B1 *	9/2011	Huang et al.	362/241
8,322,881	B1 *	12/2012	Wassel	F21V 7/00 362/217.05
2007/0047229	A1 *	3/2007	Lee	F21V 5/04 362/237
2007/0070628	A1 *	3/2007	Chen	F21S 9/03 362/249.01
2011/0063844	A1 *	3/2011	Swafford et al.	362/249.02
2012/0069568	A1 *	3/2012	Bianco et al.	362/243
2012/0262091	A1 *	10/2012	Maglica	F21L 4/005 315/307

FOREIGN PATENT DOCUMENTS

KR	20080039847	5/2008
KR	20110011191	2/2011
KR	20120086643	8/2012
KR	20120095432	8/2012
WO	WO2012/139311	* 10/2012

* cited by examiner

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(57) **ABSTRACT**

Provided is an LED lamp in which a lens for diffusing light from an LED can be received in and fixed to a reflector without interfering with the outer side of the lens. The LED lamp of the present invention includes a lamp unit configured to emit light; a lamp housing unit configured to have the lamp unit embedded in the lamp housing unit and to have the front opened so that the light of the lamp unit is scanned to the front; a front cover unit fixed in front of the lamp housing unit and configured to have the inside hollowed; and glass fixed in front of the lamp housing unit by means of the front cover unit and configured to transmit the light of the lamp unit.

9 Claims, 8 Drawing Sheets

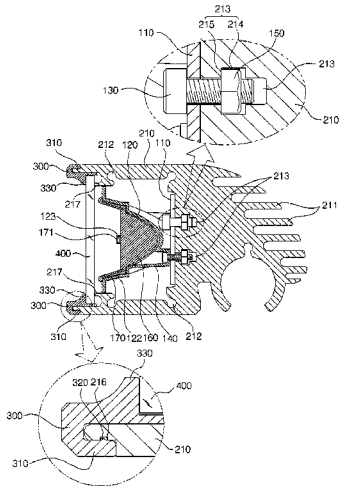
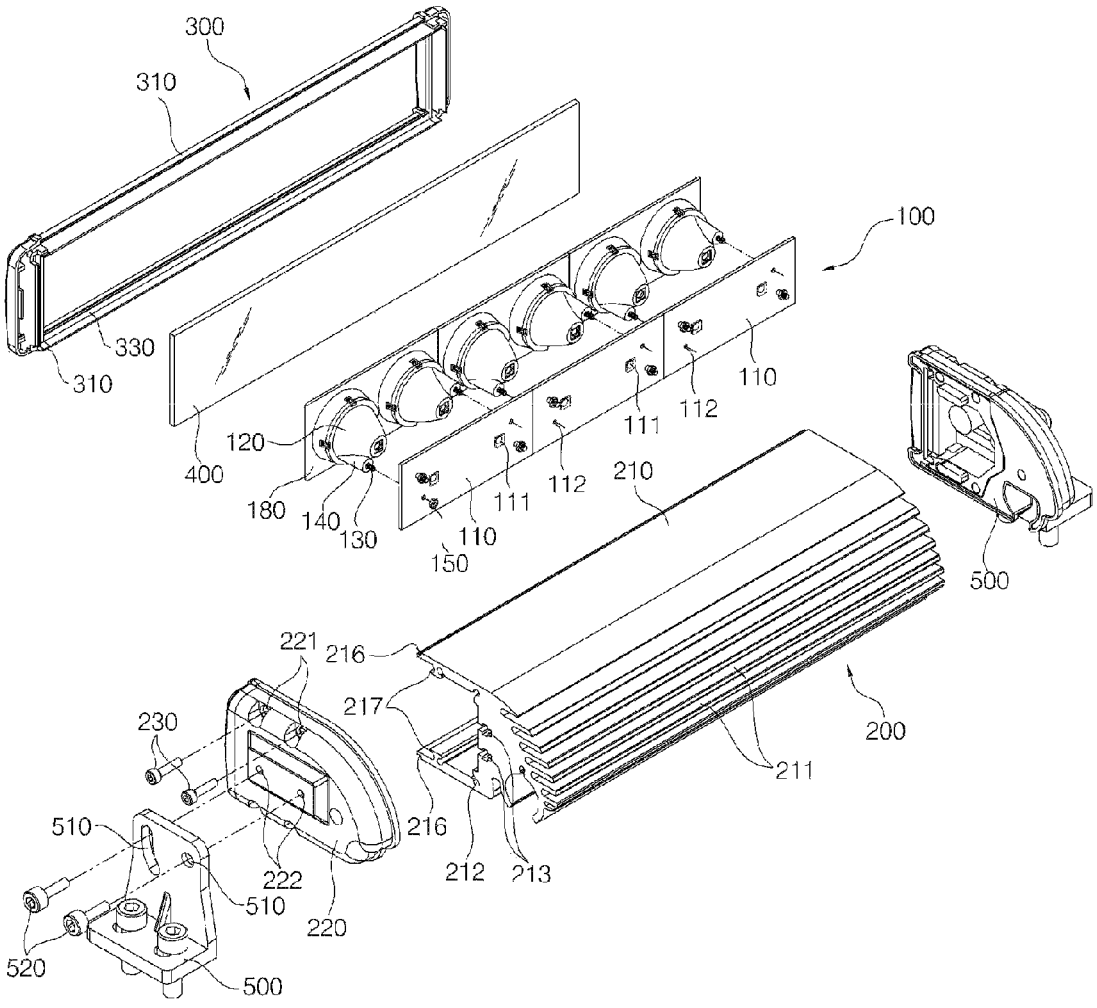


FIG. 1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310
330
310
100
110
112
111
120
400
180
140
130
150
110
111
112
210
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221
216
217
230
200
211
510
216
222
212
213
510
220
520
500

FIG. 2

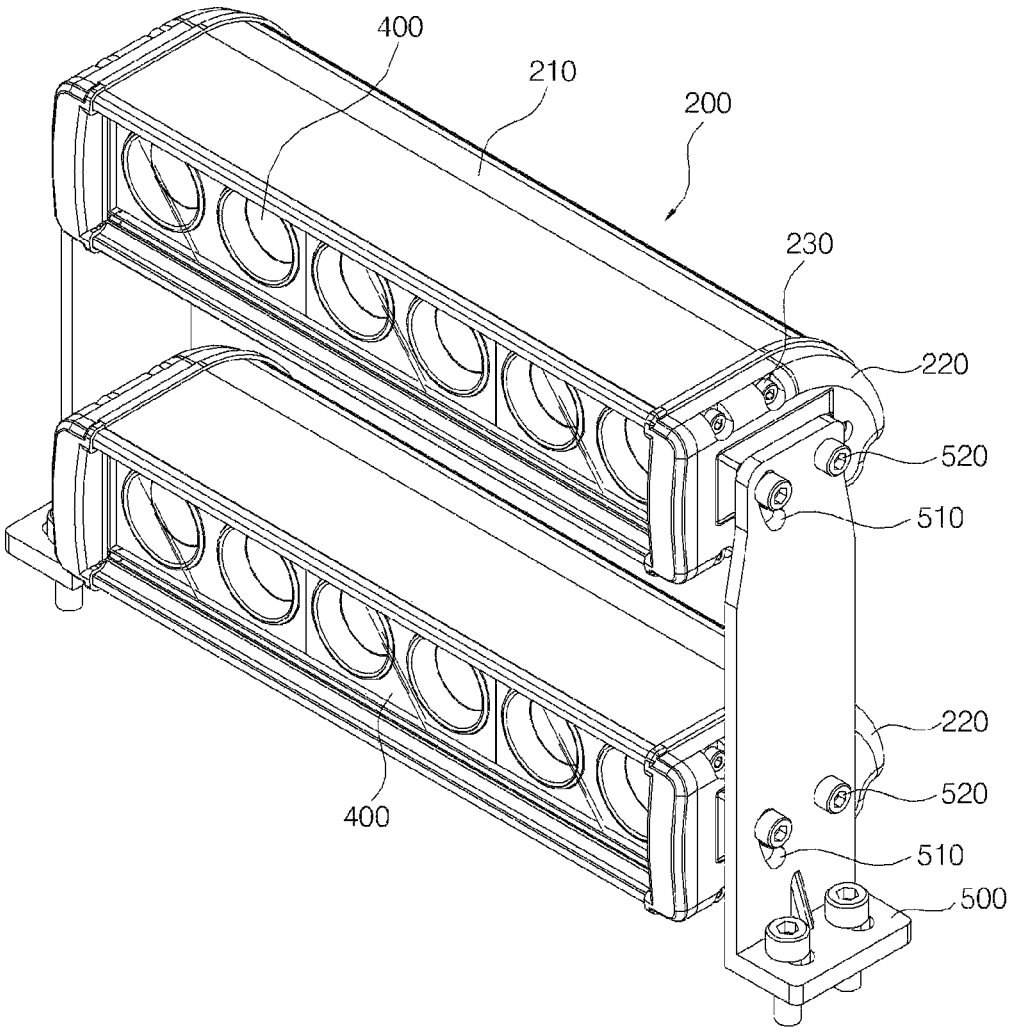


FIG. 3

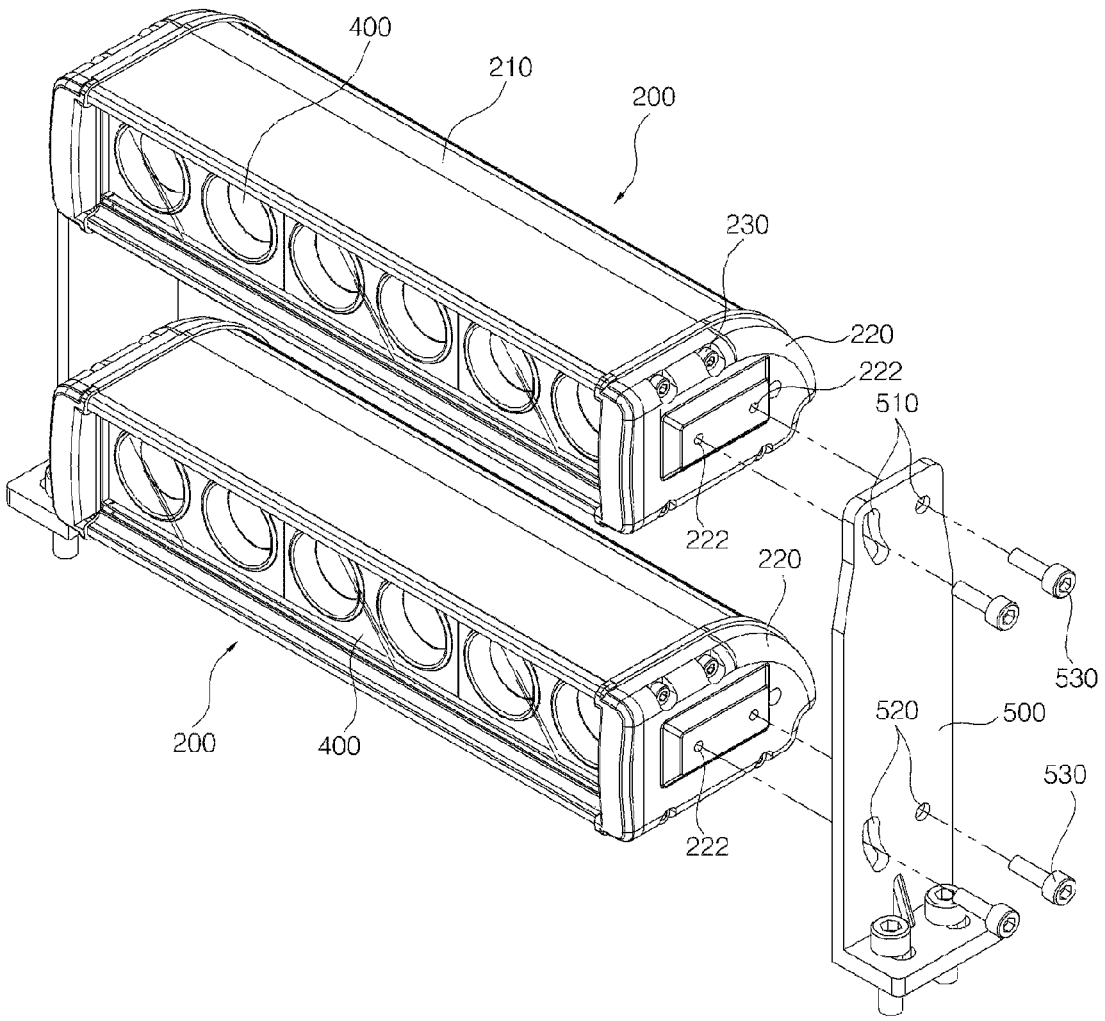


FIG. 4

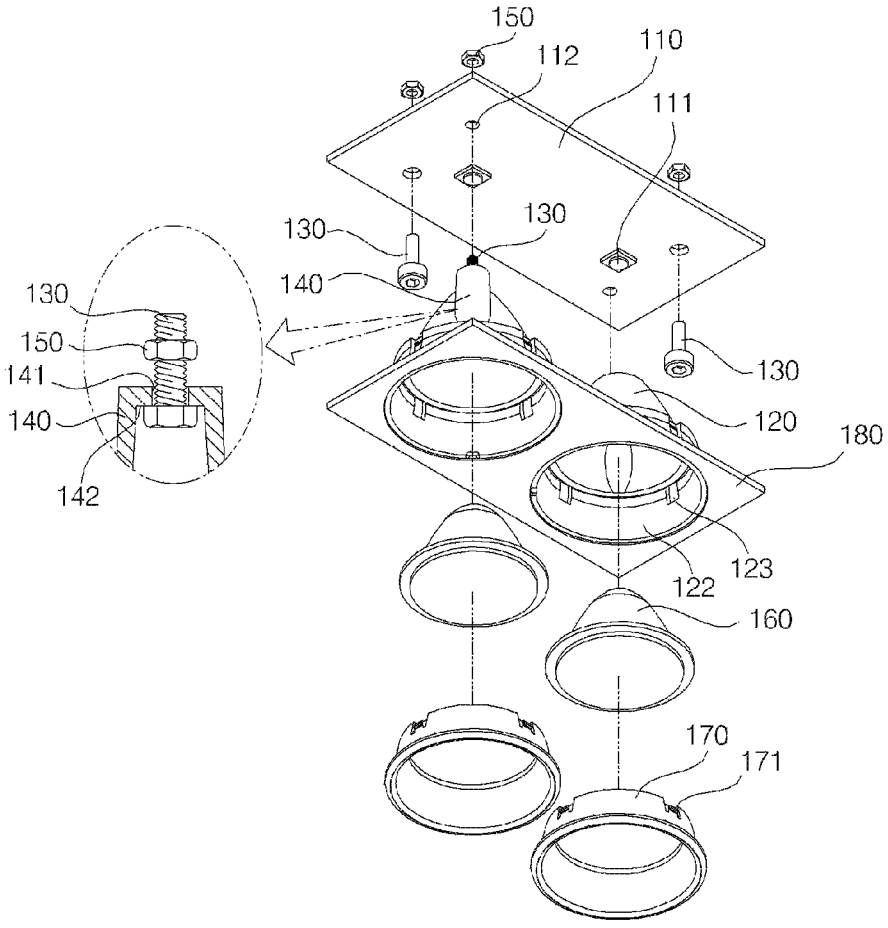
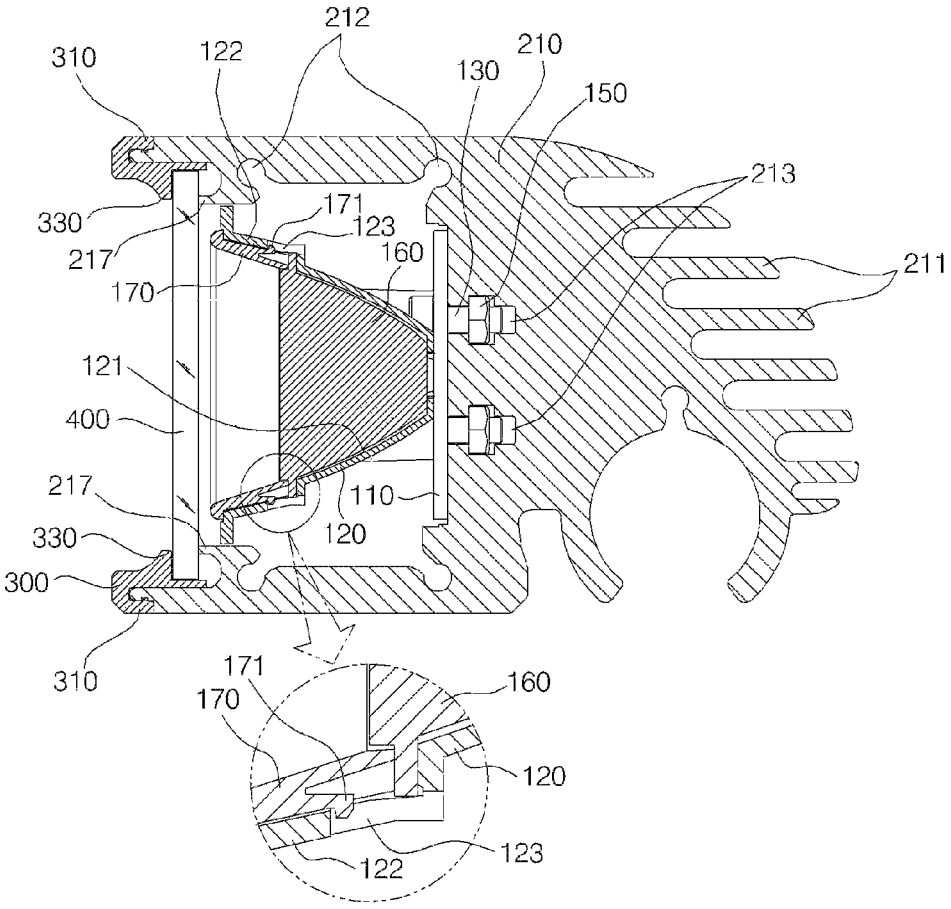

150
112
110
111
130
130
140
130
150
141
140
142
130
120
180
123
122
160
170
171

FIG. 5


212
310
122
210
130
150
213
330
171
123
217
160
211
170
121
400
217
110
120
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300
310
171
160
170
120
123
122

FIG. 6

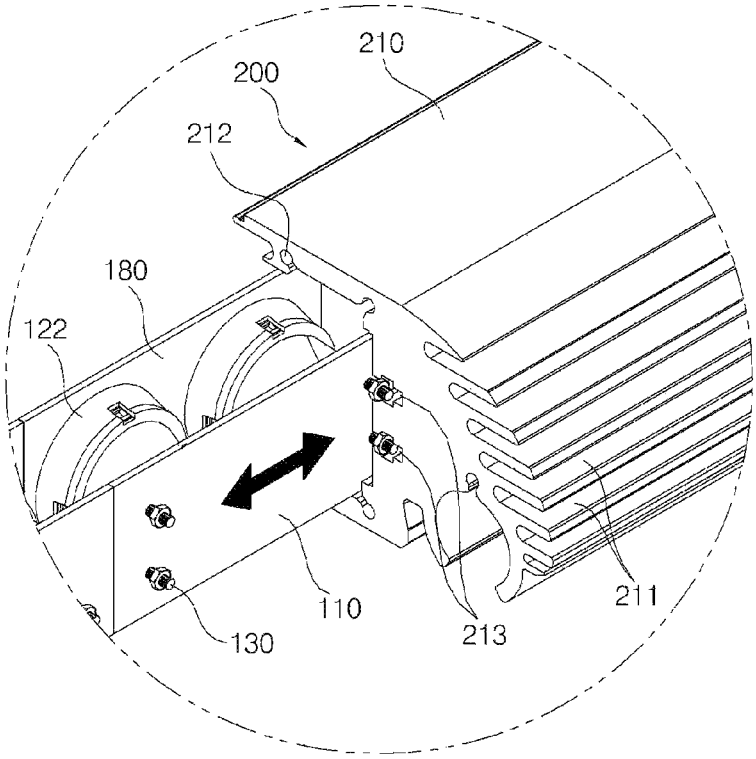


FIG. 7

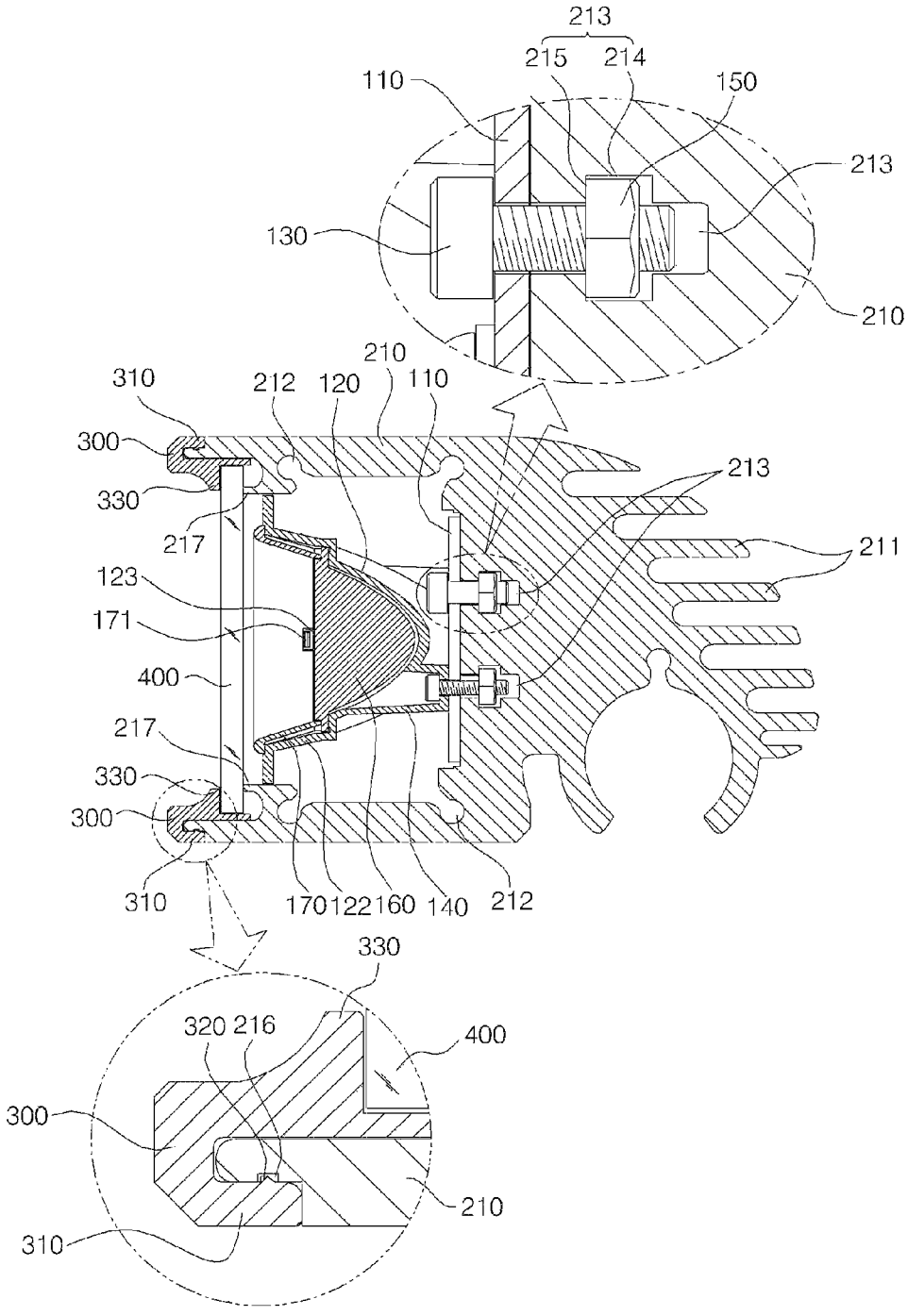
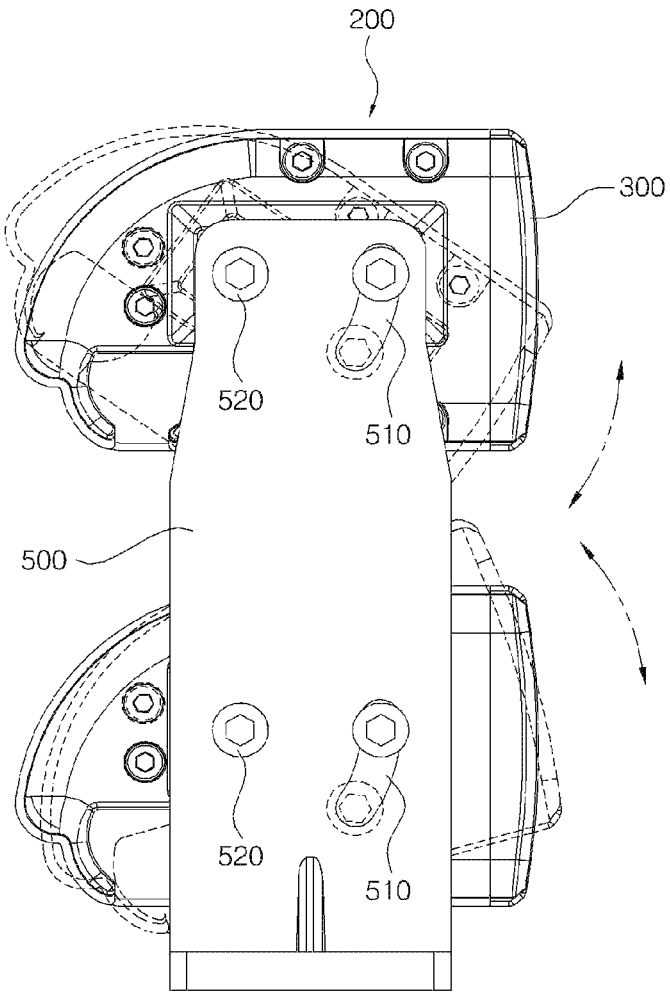

213
215
214
110
150
213
130
210
210
310
212
120
110
300
213
330
211
217
123
171
400
217
330
300
310
170
122
160
140
212
330
320
216
400
300
210
310

FIG. 8



LED LAMP

CROSS REFERENCE

The present application claims the benefit of Korean Patent Application No. 10-2012-0146526 filed in the Korean Intellectual Property Office on Dec. 14, 2012, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an LED lamp in which a lens for diffusing light from an LED can be received in and fixed to a reflector without interfering with the outer side of the lens.

2. Background of the Related Art

In general, an LED lighting apparatus is for discharging light emitted from an LED and is used for indoor use and outdoor use.

A conventional LED lens holder (Korean Patent Registration No. 20-0449951) related to the present invention has been registered with Korean Intellectual Property Office.

A conventional LED lighting apparatus is configured to include a housing, a circuit board embedded in the housing, an LED mounted on the circuit board and configured to emit light, a lens configured to diffuse light from the LED and to have a fixed hook formed on the outside thereof, and a holder body configured to reflect the light of the LED which is diffused by the lens and to have an insertion hole to which the fixed hook of the lens is detachably fixed formed therein.

Accordingly, the lens can be fixed to the reflection member by tightly fitting the fixed hook of the lens into the insertion hole in the state in which the holder body has been fixed to the circuit board so that the light of the LED is reflected.

However, the lens is problematic in that light diffused by the lens is lost through a protrusions and the insertion hole because the protrusions is integrally formed on the outside of the lens.

Furthermore, there is a problem in that an external appearance is not beautiful because the protrusions and the insertion hole are exposed to the front of the holder body.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an LED lamp in which a lens for diffusing light from an LED can be received in and fixed to a reflector without interfering with the outer side of the lens and a fixed structure for fixing the lens is not exposed to the front of a reflector.

The present invention provides an LED lamp, including a lamp unit configured to emit light; a lamp housing unit configured to have the lamp unit embedded in the lamp housing unit and to have the front opened so that the light of the lamp unit is scanned to the front; a front cover unit fixed in front of the lamp housing unit and configured to have the inside hollowed; and glass fixed in front of the lamp housing unit by means of the front cover unit and configured to transmit the light of the lamp unit. Here, the lamp housing unit includes fitting grooves formed in the outer circumferential surface of the rear and front ends of a housing member in the opened front of the lamp housing unit and inside support jaws configured to support the inner side of the glass and protruded toward the internal space of the lamp housing unit. Furthermore, the front cover unit includes cover jaws configured to cover the rear and front ends of the housing member in the opened front of the lamp housing unit, protrusions detachably fixed to the respective fitting grooves of the lamp housing unit and formed in the inner circumferential surface of the cover jaw, and outside support jaws configured to support the outer side of the glass supported by the inside support jaws.

The lamp unit preferably includes a circuit board configured to have LEDs mounted on the circuit board with the LEDs connected to a surface of the circuit board; reflectors each configured to include a reflection surface fixed to the circuit board so that the LED of the circuit board is placed at the rear end of the reflector in such a way as to penetrate the reflector and configured to reflect the light of the LED and a holder mounting hole formed at the front end of the reflection surface; lenses each inserted into the reflector and configured to diffuse the light of the LED with the lens closely adhered to the LED; and holders each inserted into the holder mounting hole of the reflector in the state in which the holder pressurizes the front end of the lens in order to prevent the lens from being detached from the reflector and configured to reflect the light of the LED which is diffused by the lens along with the reflector.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded perspective view of the LED lamp in accordance with an embodiment of the present invention;

FIG. **2** is a perspective view of the LED lamp in accordance with an embodiment of the present invention;

FIG. **3** is an exploded perspective view of the LED lamp of FIG. **2**;

FIG. **4** is an exploded perspective view showing major elements of the LED lamp according to the present invention;

FIG. **5** is a cross-sectional view showing a state in which a lamp unit has been installed in a lamp housing unit that is applied to the present invention;

FIG. **6** is a perspective view showing a state in which the lamp unit has been inserted into the lamp housing unit of the present invention;

FIG. **7** is a cross-sectional view showing the inside of a bolt reception tubes that is applied to the present invention; and

FIG. **8** is a lateral view showing a state in which a radiation angle is controlled by a bracket that is applied to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Hereinafter, an LED lamp in accordance with an exemplary embodiment of the present invention is described in detail with reference to the accompanying drawings.

As shown in FIGS. **1** and **2**, the LED lamp include a lamp unit **100** configured to emit light, a lamp housing unit **200** configured to have the lamp unit **100** embedded therein and to have the front opened so that the light of the lamp unit **100** is scanned to the front, a front cover unit **300** fixed in front of the lamp housing unit **200** and configured to have the inside hollowed, and glass **400** fixed in front of the lamp housing unit **200** by means of the front cover unit **300** and configured to transmit the light of the lamp unit **100**.

As shown in FIGS. **4** to **7**, the lamp unit **100** includes a circuit board **110**, reflectors **120**, bolt members **130**, bolt reception tubes **140**, nut members **150**, conical lenses **160**, and holders **170**.

The circuit board **110** has LEDs **111** mounted thereon with the LEDs **111** connected to a surface of the circuit board **110** and has board screw taps **112** formed in the circuit board **110** in such a way as to penetrate the circuit board **110**. Each of the reflectors **120** is fixed to the circuit board **110** so that the LED **111** formed in the circuit board **110** is placed at the rear end of the center of the reflector **120** in such a way as to penetrate the reflector **120**.

The reflector **120** has a narrow upper part and a wide lower part, has a reflection surface **121** for reflecting the light of the LED **111** formed therein, and has a holder mounting hole **122** formed at the front end of the reflection surface **121**. The bolt members **130** are screwed onto the board screw taps **112** of the circuit board **110** so that the reflectors **120** are installed in the circuit board **110**.

Each of the bolt reception tubes **140** is eccentrically penetrated on the outside of the reflector **120** and is configured to have the bolt member **130** inserted therein from the inside of the reflector **120** to the outside thereof. A shaft hole **141** through which the screw shaft of the bolt member **130** penetrates is formed in the bolt reception tube **140**. Furthermore, a bolt jaw **142** to which the head of the bolt member **130** is fitted is formed on the outside of the shaft hole **141**.

Each of the nut members **150** is configured to penetrate the shaft hole **141** of the bolt reception tube **140** and is inserted into the lamp fixing groove **213** of a housing member **210** and fixed thereto in the state in which the nut member **150** has been screwed onto the screw shaft of the bolt member **130** screwed onto the board screw tap **112** of the circuit board **110**. Each of the lenses **160** diffuses light from the LED **111** in the state in which the lens **160** has been inserted into the reflector **120** and closely adhered to the LED **111**.

Each of the holders **170** is inserted into the holder mounting hole **122** of the reflector **120** in the state in which the holder **170** pressurizes the front end of the lens **160** in order to prevent the lens **160** from being detached from the reflector **120** and is configured to reflect the light of the LED **111** which is diffused by the lens **160** along with the reflector **120**.

The LED **111** can be placed at the center of the lens **160** in the latter part of the lens **160** because the bolt reception tube **140** is eccentrically formed on the outside of the reflector **120** as described above. Furthermore, since one bolt member **130** is coupled to the board screw tap **112** in the state in which the bolt member **130** has been received in the bolt reception tube **140**, the reflector **120** can be fixed to the circuit board **110**. Accordingly, a task for fixing the reflector **120** to the circuit board **110** can be easily performed. Furthermore, the elastic protrusions **171** of the holder **170** can be detachably fixed to the fixed holes **123** of the reflector **120** in a one-touch manner easily and rapidly. Here, the holder **170**, together with the lens **160**, can forwardly reflect the light of the LED **111** by means of reflection paints coated and deposited on the inner circumferential surface of the holder **170**.

In particular, since the elastic protrusions **171** are formed in the outer circumferential surface of the holder **170**, a fine view can be provided because the elastic protrusions **171** are not exposed on the front of the holder **170** and the light of the LED **111** can be reflected without being lost by way of the inner circumferential surface of the holder **170**.

Furthermore, the circuit board **110** to which the reflectors **120** have been fixed can be fixed to the lamp housing unit **200** because the nut members **150** screwed onto the bolt members **130** are inserted into the lamp fixing grooves **213** of the lamp housing unit **200**.

The elastic protrusions **171** may be formed in the outer circumferential surface of the holder **170**. The fixed holes **123** to which the elastic protrusions **171** of the holder **170** are detachably fixed can be formed in the holder mounting hole **122** of the reflector **120** in such a way as to laterally penetrate the holder mounting hole **122**. The holder **170** can be inserted into the holder mounting hole **122** of the reflector **120** easily and rapidly in a one-touch manner because the elastic protrusions **171** is detachably fixed to the fixed holes **123**. Furthermore, light diffused by the lens **160** can be fully reflected from the reflection surface **121** of the reflector **120** without being lost outside the lens **160** because the elastic protrusions **171** and the fixed holes **123** combined together are spaced apart from the lens **160**.

Furthermore, the lamp unit **100** further includes one or more socket fixing plates **180** to each of which the front ends of two or more reflectors **120** are fixed in such a way as to penetrate the socket fixing plate **180**. The reflector **120** may be rotated around one bolt member **130** in the state in which the reflector **120** has been fixed to the circuit board **110** by means of the one bolt member **130**, but two reflectors **120** can be prevented from being rotated around the bolt member **130** because the two reflectors **120** are fixed to the socket fixing plate **180**. Furthermore, both ends of each of the socket fixing plate **180** can be stably supported by lateral members **220** fixed to both sides of the housing member **210**. Furthermore, the socket fixing plate **180** may be integrally formed at the front end of the reflector **120** by way of forming using a mold.

The lamp housing unit **200** includes the housing member **210**, lateral members **220**, and lateral screws **230**.

The housing member **210** extends along with the opened front and has an internal space formed therein. The housing member **210** includes heat dissipation pins **211** backwardly protruded from the housing member **210**, lateral screw holes **212** configured to have female threads formed on the side thereof, lamp fixing grooves **213** formed laterally from the housing member **210** and configured to have the nut members **150** inserted therein and fixed thereto, fitting grooves **216** formed in the outer circumferential surface of the rear and front ends of a housing member **210** in the opened front thereof, and inside support jaws **217** configured to support the inner side of the glass **400** and protruded toward the internal space of the lamp housing unit **200**.

The lateral members **220** cover both sides of the housing member **210** and each include lateral through holes **221** configured to correspond to the respective lateral screws holes **212** of the housing member **210**, a plurality of screw taps **222** formed in the outer circumferential surface of the lateral member **220** and spaced apart from one another forwardly and backwardly, and additional screw taps **223** downwardly spaced apart from each other from the screw taps **222** spaced apart from one another forwardly and backwardly.

The lateral screws **230** are screwed onto the respective lateral screws holes **212** in the state in which the lateral screws **230** have penetrated the lateral through holes **221**.

The heat dissipation pins **211**, the lamp fixing grooves **213**, the fitting grooves **216**, and the inside support jaws **217** may be formed by cutting and perforation processing in a length direction from one end to the other end if the housing member **210** is made of metal. Accordingly, the housing member **210** can be easily fabricated continuously in the same shape by means of cutting processing. Accordingly, a plurality of the circuit boards **110** on which the LEDs **111** have been mounted can be selectively received in the housing member **210** because the housing member **210**

processed by cutting can be cut in various lengths depending on an intention of a user as described above. Furthermore, if the housing member **210** is made of synthetic resin or aluminum, the housing member **210** can be easily extruded and molded. Furthermore, the lateral screws holes **212** can be easily formed at both ends of the housing member **210** by means of drilling.

In particular, the lamp fixing groove **213** includes a plurality of nut support surfaces **214** spaced apart from one another by an interval of both sides symmetrical to each other, of the six surfaces of the nut member **150**, and a nut fitting jaw **215** configured to face the nut support surface **214** at the front end of the nut support surface **214**, spaced apart from the nut support surface **214** at an interval greater than the diameter of the screw shaft of the bolt member **130** screwed onto the nut member **150**, and configured to have the bottom of the nut member **150** seated therein.

Accordingly, the nut member **150** can be inserted into the nut support surface **214** without being rotated because it is inserted into the lamp fixing groove **213** in the state in which both sides of the nut member **150** have been supported by the nut support surface **214**. If the bolt member **130** is rotated in such a state, the bolt member **130** can be strongly fastened because the nut member **150** has been fixed to the lamp fixing groove **213**. That is, the circuit board **110** can be firmly fixed to the inner side of the housing member **210**. Furthermore, the circuit board **110** can be mounted on the housing member **210** easily and rapidly by only inserting the nut member **150** coupled to the bolt member **130** into the lamp fixing groove **213**.

Furthermore, the nut support surfaces **214** may be formed at an interval greater than the diameter of the nut member **150**. Here, the nut member **150** can be inserted into and fixed to the circuit board **110** in the state in which the bolt member **130** and the nut member **150** have been coupled to the circuit board **110**. Furthermore, the nut member **150** is not detached from the lamp fixing groove **213** because both sides of the circuit board **110** are supported by the lateral members **220** fixed to both sides of the housing member **210**.

Furthermore, the plurality of lamp fixing grooves **213** may be formed so that the lamp fixing grooves **213** are spaced apart from one another at specific intervals and arrayed in parallel. Accordingly, the circuit board **110** can be further firmly coupled to the housing member **210** because other bolt members **130** and other nut members **150** are fixed to the circuit board **110** and inserted into a plurality of the lamp fixing grooves **213** so that they are spaced apart from the bolt member **130** and the nut member **150** coupled in order to fix the reflectors **120** to the circuit board **110**.

The front cover unit **300** includes cover jaws **310** configured to cover the rear and front ends of the housing member **210** in the opened front of the lamp housing unit **200**, protrusions **320** detachably fixed to the respective fitting grooves **216** of the lamp housing unit **200** and formed in the inner circumferential surface of the cover jaw **310**, and outside support jaws **330** configured to support the outer side of the glass **400** supported by the inside support jaws **217**.

Accordingly, the front cover unit **300** can be detachably fixed to the open side of the lamp housing unit **200** because the protrusions **320** are easily fixed to the fitting grooves **216** in a one-touch manner. As a result, the outside support jaws **330** support the outer side of the glass **400** supported by the inside support jaws **217** because the front cover unit **300** is fixed to the lamp housing unit **200** as described above. That is, the glass **400** can remain firmly fixed by means of the inside support jaws **217** and the outside support jaws **330**.

The glass **400** may be configured to be transparent in such a way as to transmit light radiated from the lamp unit **100** or may be configured to be semi-transparent for indirect lighting. The glass **400** functions to prevent alien substances from penetrating into the internal space of the lamp housing unit **200**.

The LED lamp in accordance with the present invention further includes brackets **500** configured to have a plurality of the lamp housing units **200** formed in the bracket **500** and fixed to the bracket **500** in such a manner that angles of the lamp housing units **200** are controlled while being spaced apart from one another up and down, as shown in FIGS. **1** and **8**.

Each of the brackets **500** includes a plurality of first lateral communication holes **510**, a plurality of second lateral communication holes **520**, and a plurality of angle control bolts **530**.

The first lateral communication holes **510** are spaced apart from one another forwardly and backwardly and are configured to laterally communicate with the screw taps **222** in such a way as to correspond to the screw taps **222** formed in the lateral members **220** of the lamp housing unit **200** placed on the upper side thereof and to have both ends of the first lateral communication hole **510** on the front side thereof directed upwardly and downwardly and formed in an arc shape.

The second lateral communication holes **520** are spaced apart from one another downwardly from the first lateral communication holes **510** in such a way as to correspond to the respective screw taps **222** formed in the lateral members **220** of the lamp housing unit **200** placed on the lower side and are formed to have the same shapes as the first lateral communication holes **510**.

The angle control bolts **530** are screwed onto the screw taps **222** of the lamp housing unit **200** placed on the upper side in such a way as to penetrate the respective first lateral communication holes **510** and are screwed onto the screw taps **222** of the lamp housing unit **200** placed on the upper side in such a way as to penetrate the respective second lateral communication holes **520**.

Accordingly, the housing members **210** spaced apart from each other up and down can be fixed to the brackets **500** with the angles of the housing members **210** being controlled by fastening all the angle control bolts **530** on the front and rear sides after controlling the radiation direction of the lamp unit **100** by rotating the housing members **210**, spaced apart from each other, up and down around the angle control bolts **530** on the rear side in the state in which the angle control bolts **530** have been screwed onto the screw taps **222** in such a way as to penetrate the first lateral communication holes **510** and the second lateral communication holes **520**, but have not been fully fastened.

Since the housing members **210** whose angles have been controlled are fixed to the brackets **500** as described above, the direction of light radiated from the LEDs **111** mounted on the internal spaces of the housing members **210** can be freely controlled up and down. Furthermore, the brackets **500** may be fixed to other structure by bolting.

In particular, a plurality of the lamp housing units **200** may be configured in the state in which the lateral members **220** are installed on both sides of each of the lamp housing units **200** and spaced apart from each other up and down in the brackets **500**, so the angles of the lamp housing units **200** can be controlled in the up and down directions.

For example, if the angle of the lamp housing unit **200** on the upper side is controlled upwardly and the angle of the lamp housing unit **200** on the lower side is controlled

downwardly, a wide range can be illuminated because the light of the LEDs **111** radiated from the lamp housing units **200** are spread and radiated upwardly and downwardly. Here, when the LEDs **111** embedded in the lamp housing units **200** radiate pieces of light having different colors, different positions can be illuminated with different colors. In contrast, if the lamp housing units **200** placed on the upper and lower sides are directed to or focused on the same direction, pieces of light from the LEDs **111** can be focused on one place.

In accordance with the LED lamp according to the present invention, light diffused by the lens for diffusing light from the LED can be fully reflected from the reflector without being lost outside the lens because the lens can be received in the reflector without interfering with the outer side of the lens.

Furthermore, there is an advantage in that a fine view can be obtained because the elastic protrusions and the fixed holes that are fixed structures for fixing the lens are not exposed in front of the reflector.

Furthermore, there is an advantage in that the time taken to mount the circuit board on which the LEDs have been mounted can be greatly reduced because the circuit board on which the LEDs have been mounted can be inserted into the rectangular lamp fixing grooves formed in the lamp housing and conveniently mounted thereon.

Furthermore, the nut support surface for supporting both sides of the nut member and the nut fitting jaw fitted into the bottom of the nut member are formed in the lamp fixing groove. Accordingly, the circuit board can be installed in the lamp housing easily and rapidly by rotating only the bolt members because the nut member inserted into the lamp fixing groove is not rotated.

Those skilled in the art to which the present invention pertains will understand that the present invention may be implemented in other detailed forms without changing the technical spirit or essential characteristics of the present invention. Accordingly, the aforementioned embodiments should not be construed as being limitative, but should be construed as being only illustrative from all aspects. The scope of the present invention is disclosed in the appended claims rather than the detailed description, and it should be understood that all modifications or variations derived from the meanings and scope of the present invention and equivalents thereof are included in the scope of the appended claims.

What is claimed is:

1. An LED lamp, comprising:

a lamp unit configured to emit light;

a lamp housing unit configured to have the lamp unit embedded in the lamp housing unit and to have a front opened so that the light of the lamp unit is scanned to the front;

a front cover unit fixed in front of the lamp housing unit and configured to have an inside hollowed; and

glass fixed in front of the lamp housing unit by means of the front cover unit and configured to transmit the light of the lamp unit,

wherein the lamp housing unit comprises fitting grooves formed in an outer circumferential surface of rear and front ends of a housing member in the opened front of the lamp housing unit and inside support jaws configured to support and directly contact an inner side of the glass in a single direction only at the inner side of the glass and protruded toward an internal space of the lamp housing unit, and

the front cover unit comprises cover jaws configured to cover the rear and front ends of the housing member in the opened front of the lamp housing unit, protrusions detachably fixed to the respective fitting grooves of the lamp housing unit and formed in an inner circumferential surface of the cover jaw, and outside support jaws configured to support in two directions, at the most, an outer side and an edge side of the glass supported by the inside support jaws, wherein a circumferential edge portion of the glass is configured to be enclosed and supported by the front cover unit.

2. The LED lamp of claim **1**, wherein the lamp unit comprises:

a circuit board configured to have LEDs mounted on the circuit board with the LEDs connected to a surface of the circuit board;

reflectors each configured to comprise a reflection surface fixed to the circuit board so that the LED of the circuit board is placed at a rear end of the reflector in such a way as to penetrate the reflector and configured to reflect the light of the LED and a holder mounting hole formed at a front end of the reflection surface;

lenses each inserted into the reflector and configured to diffuse the light of the LED with the lens closely adhered to the LED; and

holders each inserted into the holder mounting hole of the reflector in a state in which the holder pressurizes a front end of the lens in order to prevent the lens from being detached from the reflector and configured to reflect the light of the LED which is diffused by the lens along with the reflector.

3. The LED lamp of claim **2**, wherein:

the holder comprises elastic protrusions formed in an outer circumferential surface of the holder, and

the reflector comprises fixed holes configured to have the elastic protrusions of the holder detachably fixed to the fixed holes and formed in the holder mounting hole in such a way as to laterally penetrate the holder mounting hole.

4. The LED lamp of claim **2**, wherein reflection paints are coated on an inner circumferential surface of the holder.

5. The LED lamp of claim **2**, further comprising:

board screw taps formed in the circuit board in such a way as to penetrate the circuit board;

bolt members each screwed onto a board screw tap of the circuit board so that the reflector is installed in the circuit board;

bolt reception tubes each configured to have the bolt member inserted into the bolt reception tube from an inside to an outside of the reflector so that the bolt member communicates with the bolt reception tube and to comprise a shaft hole configured to have a screw shaft of the bolt member penetrate through the shaft hole and a bolt jaw configured to have a head of the bolt member fitted into the bolt jaw and formed on an outside of the shaft hole; and

nut members each configured to penetrate the shaft hole of the bolt reception tube and fixed to the lamp housing unit screwed onto a screw shaft of the bolt member screwed onto the board screw tap of the circuit board.

6. The LED lamp of claim **2**, wherein the lamp unit further comprises a socket fixing plate configured to have fronts of two or more reflectors fixed to the socket fixing plate in such a way as to penetrate the socket fixing plate.

7. The LED lamp of claim **1**, wherein the lamp housing unit comprises:

a housing member configured to extend along with the opened front, to have an internal space formed in the housing member, and to comprise heat dissipation pins backwardly protruded from the housing member, lateral screw holes configured to have female threads formed on a side of the housing member, and lamp fixing grooves formed laterally from the housing member and configured to have a nut members inserted into and fixed to the lamp fixing grooves;

lateral members configured to cover both sides of the housing member and each configured to comprise lateral through holes configured to correspond to the respective lateral screws holes of the housing member and a plurality of screw taps formed in an outer circumferential surface of the lateral member and spaced apart from one another forwardly and backwardly; and

lateral screws screwed onto the lateral screws holes in a state in which the lateral screws have penetrated the lateral through holes.

8. The LED lamp of claim **7**, wherein each of the lamp fixing grooves comprises:

a plurality of nut support surfaces spaced apart from one another by an interval of both sides that are symmetrical to each other, of six surfaces of the nut member; and

a nut fitting jaw configured to face the nut support surface at a front end of the nut support surface, spaced apart from the nut support surface at an interval greater than a diameter of a screw shaft of the bolt member screwed onto the nut member, and configured to have a bottom of the nut member seated in the nut fitting jaw.

9. The LED lamp of claim **7**, further comprising brackets configured to have a plurality of the lamp housing units formed in the bracket and fixed to the bracket in such a manner that angles of the lamp housing units are controlled while being spaced apart from one another up and down,

wherein each of the brackets comprises:

a plurality of first lateral communication holes spaced apart from one another forwardly and backwardly and configured to laterally communicate with the screw taps in such a way as to correspond to the screw taps formed in the lateral members of the lamp housing unit placed on an upper side and to have both ends of the first lateral communication hole on a front side directed upwardly and downwardly and formed in an arc shape;

second lateral communication holes spaced apart from one another downwardly from the first lateral communication holes in such a way as to correspond to the respective screw taps formed in the lateral members of the lamp housing unit placed on a lower side and formed to have an identical shape as the first lateral communication holes; and

angle control bolts screwed onto the screw taps of the lamp housing unit placed on an upper side in such a way as to penetrate the respective first lateral communication holes and screwed onto the screw taps of the lamp housing unit placed on the upper side in such a way as to penetrate the respective second lateral communication holes.

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